What is claimed is:

Claim 1. A bonding method for bonding metallic members, which comprises the steps of: fitting a metallic members to another metallic member, followed by effecting preliminarily plastic bonding by means of a preliminarily bonding punch; and generating compression force in an axial direction of the members in the vicinity of the fitting portion of the bonding members after the preliminarily plastic bonding, and , allowing part of the material of the bonding member to effect plastic-flow in such a manner as to fill a gap defined between the metallic members, so as to plastically bond the members.

Claim 2. A bonding method for bonding a bonding member onto a member to be bonded, which are used in a device for rotating the bonding member serving as a rotary disk and the to-be-bonded member serving as a rotary shaft in integral bonding, the bonding method comprising:

a first step of fitting the bonding member to the member to be bonded, followed by preliminarily plastic bonding by a preliminarily bonding punch; and

a second step of generating compression force in an axial direction of the to-be-bonded member in the vicinity of the fitting portion of the bonding member after the preliminarily plastic bonding in the first step, and then, allowing part of the material of the bonding member to plastic-flow in such a manner as to fill a clearance defined between the bonding member and the member to be bonded, so as to plastically bond the bonding member onto the member to be bonded;

whereby the bonding member and the member to be bonded are tightly integrated with each other.

Claim 3. A bonding method for bonding a bonding member onto a member to be bonded as claimed in claim 2, wherein the bonding member and the member to be bonded are freely fitted to each other.

Claim 4. A bonding method for bonding a bonding member onto a member to be bonded, which are used in a device for rotating the bonding member serving as a rotary disk and the to-be-bonded member serving as a rotary shaft in integral bonding, the bonding method comprising the steps of:

inserting the member to be bonded into a fitting hole formed at the bonding member having an inner diameter greater than an outer diameter of the member to be bonded, and positioning the member to be bonded thereat;

pressurizing a portion, in the vicinity of the fitting portion of the member to be bonded, of the bonding member at a load for generating a stress enough to plastically deform the material of the bonding member, followed by preliminarily plastic bonding;

further pressurizing the portion, in the vicinity of the fitting portion of the member to be bonded, of the bonding member at a load in excess of an elastic limit of the material of the bonding member; and

generating compression force in an axial direction of the to-be-bonded member at the portion in the vicinity of the fitting portion of the bonding member, and then, allowing part of the material of the fitting portion in excess of the elastic limit to plastic-flow in such a manner as to

fill a clearance defined between the member to be bonded and the bonding member;

whereby the bonding member and the member to be bonded are tightly integrated with each other.

Claim 5. A bonding method for bonding a bonding member onto a member to be bonded as claimed in claim 1, wherein an annular groove is formed at the fitting portion of the to-be-bonded member to the bonding member.

Claim 6. A bonding method for bonding a bonding member onto a member to be bonded as claimed in claim 5, wherein a knurl is formed at the annular groove formed at the fitting portion of the to-be-bonded member to the bonded member.

Claim 7. A bonded body of a bonding member and a member to be bonded, which are used in a device for rotating the bonding member on which rotary disks are stacked and the member to be bonded serving as a rotary shaft in integral bonding:

wherein a portion, in the vicinity of the fitting portion of the member to be bonded, of the bonding member is pressurized at a load for generating a stress enough to plastically deform the material of the bonding member, followed by preliminarily plastic bonding;

further the portion, in the vicinity of the fitting portion of the member to be bonded, of the bonding member is pressurized at a load in excess of an elastic limit of the material of the bonding member; and

a compression force in an axial direction of the to-be-bonded member is generated at the portion in the vicinity of the fitting portion of

the bonding member, and then, part of the material of the fitting portion in excess of the elastic limit is allowed to plastic-flow in such a manner as to fill a clearance defined between the member to be bonded and the bonding member;

whereby the bonding member and the member to be bonded are tightly integrated with each other.

Claim 8. A bonded body of a bonding member and a member to be bonded as claimed in claim 7, wherein an annular groove is provided at the fitting portion of the to-be-bonded member to the bonding member.

Claim 9. A bonded body of a bonding member and a member to be bonded as claimed in claim 8, wherein a knurl is formed at the annular groove formed at the fitting portion of the to-be-bonded member to the bonding member.

Claim 10. A mechanical apparatus provided with a bonded body of a bonding member and a member to be bonded, which are used in a device for rotating the bonding member on which rotary disks are stacked and the to-be-bonded member serving as a rotary shaft in integral bonding:

wherein a portion, in the vicinity of the fitting portion of the to-be-bonded member, of the bonding member is pressed to provide a plastically deformed part, which is in the vicinity of the fitting portion of the to-be-bonded member and is further pressed, followed by plastic-flow bonding.